EXHIBIT A

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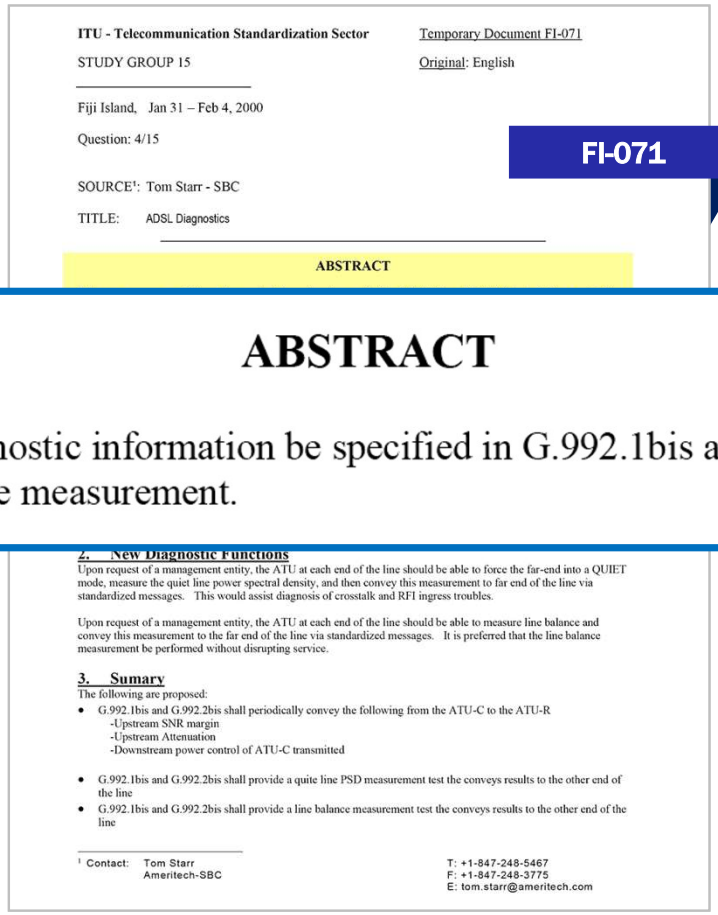
Dr. Leonard J. Cimini, Jr. Demonstratives

DDX-001

AT&T Contribution (FI-071) builds upon ADSL



ITU - Telecommunication Standardization Sector Temporary Document FI-071

STUDY GROUP 15 Original: English

Fiji Island, Jan 31 – Feb 4, 2000

Question: 4/15

FI-071

SOURCE[1]: Tom Starr - SBC

TITLE: ADSL Diagnostics

ABSTRACT

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This paper proposes additional diagnostic information be specified in G.992.1bis and G.992.2bis including a quiet line PSD measurement and a line balance measurement.

2. New Diagnostic Functions

Upon request of a management entity, the ATU at each end of the line should be able to force the far-end into a QUIET mode, measure the quiet line power spectral density, and then convey this measurement to far end of the line via standardized messages. This would assist diagnosis of crosstalk and RFI ingress troubles.

Upon request of a management entity, the ATU at each end of the line should be able to measure line balance and convey this measurement to the far end of the line via standardized messages. It is preferred that the line balance measurement be performed without disrupting service.

3. Sumary

The following are proposed:

- G.992.1bis and G.992.2bis shall periodically convey the following from the ATU-C to the ATU-R
  - -Upstream SNR margin
  - -Upstream Attenuation
  - -Downstream power control of ATU-C transmitted
- G.992.1bis and G.992.2bis shall provide a quite line PSD measurement test the conveys results to the other end of the line
- G.992.1bis and G.992.2bis shall provide a line balance measurement test the conveys results to the other end of the line

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"instructions that when executed communicate diagnostic information"

'686 Patent, claim 36

36. An information storage media comprising instructions that when executed communicate diagnostic information over a communication channel using multicarrier modulation comprising:

instructions that when executed direct a transceiver to receive or transmit an initiate diagnostic mode message; and

instructions that when executed transmit from the transceiver a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic informa
nel, and wherein o
senting is frequenc
information.

AT&T Contribution (FI-071)

1. Availability of diagnostic information at both ends of the line

There are occasions where diagnostic tests are performed from either end of the subscriber line. Tests invoked from a central network operations center are performed from the network end of the line. On other occasions a network technician may perform installation/trouble testing from the customer premises or a cross-box in the loop plant using portable test equipment. Also, the customer, aided by diagnostic software in their PC could help diagnose some troubles. All of these diagnostic efforts are assisted by conveying all parameters observed at the far end of the loop to the other end of the loop via standardized messages.

There are occasions where diagnostic tests are performed from either end of the subscriber line.

"instructions that when executed transmit from the transceiver a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message"

'686 Patent, claim 36

36. An information storage media comprising instructions that when executed communicate diagnostic information over a communication channel using multicarrier modulation comprising:

instructions that when executed direct a transceiver to receive or transmit an initiate diagnostic mode message; and

instructions that when executed transmit from the transceiver a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and wherein one variable comprises an array representing is frequency domain received idle channel noise information.

ADSL

Table 10-5/G.992.1 – C-RATES1

	Prefix	Option 1			Option 2			Option 3			Option 4		
		B_F	B_I	*RRSI*	B_F	B_I	*RRSI*	B_F	B_I	*RRSI*	B_F	B_I	*RRSI*
Number of bytes	4	10	10	10	10	10	10	10	10	10	10	10	10

Only one bit of information is transmitted in each symbol of C-RATES1: a zero bit is encoded to one symbol of C-REVERB1 and a one bit is encoded to one symbol of C-SEGUE1. Since there are a total of 992 bits of C-RATES1 information, the duration of C-RATES1 is 992 symbols. The 992 bits are to be transmitted in the order shown in Table 10-5, with the least significant bit first. That is, the least significant bit of option 1, B_F, is to be transmitted during the 33rd symbol of C-RATES1, after the prefix. Following C-RATES1, the ATU-C shall enter state C-CRC1.

"wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel"

'686 Patent, claim 36

36. An information storage media comprising instructions that when executed communicate diagnostic information over a communication channel using multicarrier modulation comprising:

instructions that when executed direct a transceiver to receive or transmit an initiate diagnostic mode message; and

instructions that when executed transmit from the transceiver a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and wherein one variable comprises an array representing is frequency domain received idle channel noise information.

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3. Sumary

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